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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09/760,239	01/13/2001	Francis H. Koh		2556

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Francis H. Koh
8811 Falls Road
Potomac, MD 20854

EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/760,239

Applicant(s)

KOH ET AL.

Examiner

Jeffrey T Barton

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Priority

1. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not state that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

The specification to which the oath or declaration is directed has not been adequately identified. See MPEP § 601.01(a).

It does not state that the person making the oath or declaration has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration.

Specification

4. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.
5. The disclosure is objected to because of the following informalities: an error in use of reference number 6. In figures 1 and 3, and in the first sentence of the detailed description of the invention, reference number 6 denotes closed chambers in the cassette. Reference number 6 is used to refer to the outer plate later in the paragraph, apparently in error.

Appropriate correction is required.

Claim Objections

6. Claim 1 is objected to because of the following informalities: a confusing phrase, "longitudinally across." The disclosed use of the cassette and the word "longitudinally"

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imply that the channels run lengthwise along the plate, not across it. Appropriate correction is required.

7. Claim 3 is objected to because of the following informalities: use of the word "using" does not explicitly limit the claim. Please substitute "having" or "including" in its place. Appropriate correction is required.

8. Claims 4 and 5 are objected to because of the following informalities: improper antecedent basis for "said closed chambers". Claim 1 uses the phrase, "closed individual chambers," and the same language should be used in the dependent claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Maracas et al.

Addressing claims 1, 2, and 4-7, Maracas et al disclose a gel electrophoresis device, which includes a base plate with channels extended across (plate 40, channels 46, 48, 50, and 52 in Figure 2; column 4, lines 39-43) and an outer plate used to cover

the base plate and define the channels (plate 42 in Figure 2; column 4, lines 44-47). Gel is cast in these channels (column 4, lines 54-65), and upon removal of the outer plate, the gels remain in the open channels (See Figure 19, reference numbers 446, 450, and 452; column 18, lines 11-24).

Addressing claim 2, Maracas et al disclose several possible materials for the construction of plates 40 and 42, including glass, polymers, or plastic. (column 4, lines 48-50) Plates 40 and 42 can be construed as the casing for an electrophoresis cassette.

Addressing claim 4, Maracas et al disclose channels 46, 48, 50, and 52 with openings at opposite ends of plates 40 and 42. (Figure 2)

Addressing claim 5, Maracas et al disclose regions at the ends of the channels (Figure 2, filling regions 54 and 56), which could allow communication of polymerizing gel between channels.

Addressing claim 6, Maracas et al disclose regions at the ends of the channels (Figure 2, filling regions 54 and 56), which provide indentations in the base plate (i.e. widening of the channel) in which gel can polymerize.

Addressing claim 7, Maracas et al disclose the channels 46, 48, 50, and 52 as being formed from void spaces in the base plate. (first plate 40 in Figure 2)

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maracas et al in view of Lugojan.

Maracas et al disclose an electrophoresis device as described in paragraph 10 above.

Maracas et al do not explicitly disclose the use of adhesive material or a clamping device the secure plates 40 and 42 together.

Lugojan discloses the use of adhesive tape (tape 14, Figure 2) along the peripheral edges of the plates that form the electrophoresis cassette of his invention, as a means of holding the plates together (column 3, lines 10-15).

Maracas et al and Lugojan are analogous art in that both describe devices in which gel is cast for the purpose of electrophoretic analysis.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Maracas et al by securing plates 40 and 42 with adhesive tape, as taught by Lugojan, because tape provides a convenient, inexpensive, releasable, liquid-tight seal for this application.

13. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maracas et al in view of Berninger et al.

Maracas et al disclose an electrophoresis device as described in paragraph 10 above.

Maracas et al do not explicitly disclose the use of raised T rails running parallel to each other on the base plate, to form channels (claim 8), or these T rails being extruded and formed as a solid piece with the base plate (claim 9).

Berninger et al disclose the use of inwardly sloping walls (walls 204, Figure 2) as a means of retaining an electrophoresis gel within gel casting deck 202. (column 6, lines 29-38) These walls perform the same function as the claimed T rails. They are fixed upon the base plate, and run parallel to each other (claim 8), and appear to be formed as a solid piece with the base plate (claim 9).

Maracas et al and Berninger et al are analogous art in that both describe devices in which gel is cast for the purpose of electrophoretic analysis.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Maracas et al by including gel-retaining means integral to the base plate in channels 46, 48, 50, and 52, such as T rails or the inwardly-sloping walls taught by Berninger et al, because it would prevent unintended lifting of the gels from the channels.

14. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maracas et al and Berninger et al as applied to claims 8 and 9 above, and further in view of Blasband.

Maracas et al and Berninger et al disclose devices as described above.

Neither Maracas et al nor Berninger et al disclose channel defining T rails formed from rail blocks, raised from the base plate and made solid with the base plate, or attached to the base plate, where flat plates are attached to the blocks to form T-rails.

Blasband discloses the use of spacers to separate opposing plates to define a volume that holds a gel slab for electrophoresis (column 2, lines 23-29).

Maracas et al, Berninger et al, and Blasband are analogous art in that all describe devices in which gel is cast for the purpose of electrophoretic analysis.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Maracas et al and Berninger et al by forming the T rails or inwardly sloping walls by attaching appropriately formed barriers to a plate, as taught by Blasband, because it might facilitate the construction of the device.

15. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maracas et al in view of Lugojan as applied to claim 3 above, and further in view of Garrels.

Maracas et al and Lugojan disclose electrophoresis devices as described above, the obvious combination of these devices includes adhesive material securing the two plates together.

Regarding claims 11-16, Maracas et al further disclose a method of using their apparatus, including steps of forming a sandwich structure by covering plate 40 with

plate 42 (column 4, lines 44-47), thereby defining closed chambers (46, 48, 50, and 52) with openings at opposite ends (See Figure 2).

Regarding claims 12-16, Maracas et al further disclose the introduction of a gel polymerizing solution to the closed chambers (46, 48, 50, and 52) (column 4, lines 60-65), with space remaining to load samples to the columns (via filling regions 54 and 56).

Regarding claims 13-16, Maracas et al further disclose the introduction of samples to the chambers. (column 4, line 66-column 5, line 10)

Regarding claims 14-16, Maracas et al further disclose automated operation of their system with a substrate corresponding to plate 40 in Figure 2. (column 17, lines 12-30) As diagrammed in Figure 19, the method involves addition of gel, buffer, and samples prior to electrophoretic separation. This can be viewed as an elution system.

Regarding claims 15-16, Maracas et al further disclose the removal of the outer plate after electrophoresis, exposing the gel columns (Figure 19, reference numbers 446, 450, and 452; column 18, lines 11-24)

Maracas et al do not explicitly disclose the use removable adhesive material or a clamp device to seal the exit openings prior to introduction of the gel polymerizing solution. (claims 11-16) Furthermore, Maracas et al do not explicitly disclose the treatment of the finally exposed gel columns with an image developing solution (claim 16), nor do they disclose this solution communicating with the gel through the open face regions, thereby forming an image, followed by treatment with a fixing solution.

Garrels discloses the use of tape to seal the gel casting chamber (column 14, lines 9-10), and the treatment of gels on their exposed faces with a staining solution, after electrophoresis (column 14, lines 42-59).

Maracas et al, Lugojan, and Garrels are analogous art in that all describe devices in which gel is cast for the purpose of electrophoretic analysis.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of using the combination of Maracas et al and Lugojan by sealing one end of the cassette with tape prior to gel introduction, as taught by Garrels, because it would prevent overflow of the solution. It would also be obvious to one of ordinary skill in the art at the time of the invention to modify the method of Maracas et al by apply a staining solution to the exposed gels after removal of the cover plate, as taught by Garrels, because it would provide an additional means of analysis of the separation.

16. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maracas et al, Lugojan, and Garrels as applied to claims 11-16 above, and further in view of Stone et al.

Maracas et al, Lugojan, and Garrels disclose an obvious combination as described above. In addition, Garrels discloses the communication of the image developing solution with the exposed surface of the gel, corresponding to the open face region (column 14, lines 42-59).

None among Maracas et al, Lugojan, and Garrels disclose the exposure of the gels to a fixing solution.

Stone et al disclose a process for staining electrophoretic gels that includes application of a fixing solution to the gels, in addition to stain.

Maracas et al, Lugojan, Garrels, and Stone et al are analogous art in that all deal with analysis of material by gel electrophoresis.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Maracas et al, Lugojan, and Garrels by replacing one stain in reservoir 146 or 148 in Figure 5C of Garrels with a fixing solution, as taught by Stone et al, because it would prevent diffusion of the analyzed materials.

Conclusion


17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wiktorowicz et al and MacConnell disclose electrophoresis apparatuses with multiple channels and similar design.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

JTB
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